

KB-111/111P Speaker Station

**INSTRUCTION
and
SERVICE MANUAL**



1111 17th Street • San Francisco, California 94107 • 415-861-6666

KB-111/111P REMOTE SPEAKER STATION

Instruction Manual

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I. INTRODUCTION TO THE KB-111/111P REMOTE STATION

The Clear-Com KB-111/KB-111P is a Remote Speaker Station that is:

a) a 2-channel wall-mount unit
(KB-111)

OR

b) a single-channel portable unit, with two channels available as an option
(KB-111P)

The KB-111 is mounted in a brushed stainless-steel wall plate, complete with a "back box" for simple installation.

The KB-111P, whether single or dual-channel, has all the features provided by the wall-mount version. However, it is enclosed in a heavy gauge, steel chassis that has a handle, rubber feet, and two XLR-type, 3-pin connectors for input

and extension connections within the intercom system.

The KB111/P features a 4" wide, weather-proof speaker which delivers sound pressure levels high enough to be heard in the noisiest environments.

Although the KB-111/P functions primarily as a listen-only station, Clear-Com has provided several options for talk-back capability.

Standard 2-conductor shielded mic cable interconnects stations within the intercom network. In locations where conduit is present, or where AC interference is not a problem, you may interconnect stations with unshielded wire or unshielded cable.

II. KB-111/111P OPERATING CONTROLS

The KB-111/P controls are straightforward and simple to use.

The A/B toggle switch on two-channel units selects the channel that the station will use for communication.

The KB-111/P provides a Volume knob that adjusts the listen levels for both the speaker and optional headset.

A combination Speaker/Private/Call toggle switch provides three functions. In the normal (up) position, the speaker is on.

The middle (Private) position works in conjunction with a connected headset or handset; when the switch is set to Private, the speaker is off while the headset remains on,

thereby enabling private communication which may be necessary in a quiet environment.

The third position, Call, is associated with the Visual Signal feature that is standard on Clear-Com equipment. It allows the intercom users to attract the attention of operators who have removed their headsets. Signalling other stations is accomplished by momentarily pressing the switch down to the Call position. Signalling follows the position of the channel select switch (on two-channel units); for instance; if you are on Channel A, signalling activates the call lights on all stations assigned to that channel.

The Call Light on the KB-111/P front panel illuminates when ano-

ther station calls you, or when you are calling other stations.

The KB-111/P also includes a unique Sidetone control, which enables the operator to adjust the level of his voice as heard in the speaker or headset, allowing up to 35 dB reduction of acoustical pick-up. The Sidetone control also suppresses feedback when using a mic. You need only adjust the sidetone once (if at all), even if other stations subsequently join or leave the intercom network. Adjusting the sidetone does not affect the level of incoming or outgoing signals.

The sidetone control is inside an unmarked hole next to the Volume knob on the front panel. The sidetone adjustment is accomplished with a small-bladed screwdriver.

III. HEADSETS AND MICS

For talk-back functionality, the KB-111/P front panel provides a D4M connector for plugging in a headset, telephone handset, push-to-talk hand-held mic, or wall-mount mic.

The Remote Station's built-in headset amplifier can drive one or two headsets to a level greater than 110 dB SPL. The Station's mic pre-amplifier automatically shuts off when the unit is disconnected from a mic or headset, thereby eliminating hum pick-up and extraneous noise.

The front panel headset connector is an XLR-type 4-pin male (as are all Clear-Com headset connectors). The connector pin-out assignment is:

- Pin 1: Mic Ground
- Pin 2: Mic Hot
- Pin 3: Headphone Ground
- Pin 4: Headphone Hot

At the factory, Clear-Com sets the sidetone to be approximately 6 dB lower than the station's incoming signals.

To change the signal level, or if feedback occurs between the speaker and an attached mic or headset, take the following steps:

- 1) turn on mic or headset.
- 2) turn up volume all the way.
- 3) insert screwdriver through front panel hole and engage the slot on the internal trim pot.
- 4) begin talking to yourself while slowly turning the screwdriver. When you can barely hear yourself, you'll have found the null point (this is the proper setting for minimum feedback when using both the speaker and a mic).

To assure proper level and performance, the headsets (or handsets or mics) should have the following characteristics:

Microphone type:	dynamic
Impedance:	150-250 ohms
Output Level:	-55 dB
Headphone Type:	dynamic
Output Impedance:	300 -2000 ohms

Clear-Com offers its users 3 standard headsets, all with boom-mounted, noise-cancelling microphones. Model CC-240B is a double-muff headset, and Model CC-75 B is single-muff; both have boom-activated dynamic mics with built-in ON/OFF switches. Model PH-7 is a double-muff, high-fidelity headset with wider frequency response, greater isolation from ambient noise, and a very sturdy physical construction.

The Clear-Com HS-6 telephone-style

handset has a dynamic mic and a push-to-talk switch, and is interchangeable with the above headsets. Our Model PT-4 is a hand-held push-to-talk mic for use with speaker stations.

All units have field-replacable cords.

All Remote Stations will drive two headsets with only a slight reduction in level. Clear-Com can supply you with Model YC-100 "Y" Adapter Cable, which allows you to plug two headsets into the one connector provided on the Station's front panel.

Alternately, you may construct your own Y-cable; we recommend you use Belden 8416 (25 gauge, 2-conductor) or Belden 8734 (22 gauge, 3-conductor); see Figure 1 below.

If desired, you may construct an extension cord for your headset, using the same cable specified above (see Figure 2). Limit the extension to 15 feet or less; greater lengths lead to possible capacity coupling between the mic signal and the headset signal, which would cause oscillation or a loss in the high frequency response.

FIGURE 1: HEADSET "Y" CABLE CONNECTIONS

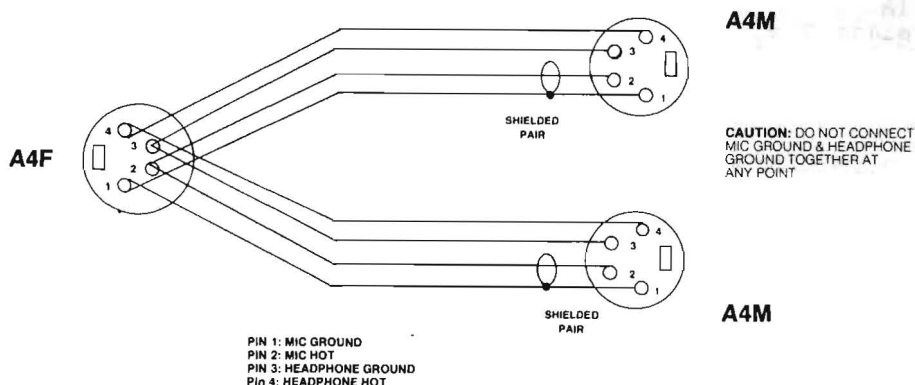
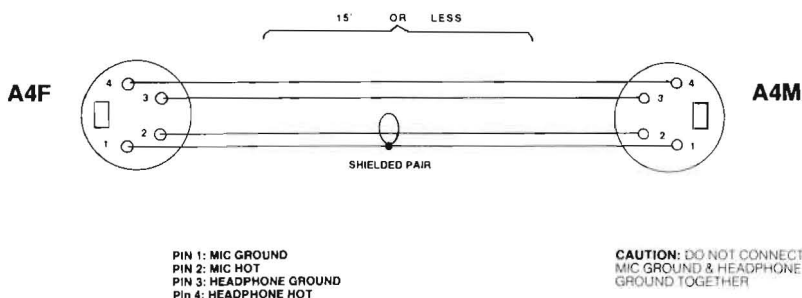


FIGURE 2: HEADSET EXTENSION CORD



IV. INSTALLATION OF THE REMOTE SPEAKER STATION

The KB-111 Two-Channel Remote Station is connected to the intercom system through its five-terminal mounting block. After mounting the back box and bringing wiring into the unit, make the following connections (see illustration):

- 1--Chassis Ground
- 2--Intercom Audio/Channel A
- 3--Intercom Audio/Channel B
- 4--DC: +30 volts
- 5--Common



If you plan to use only one channel on the KB-111, disable the Channel Select switch by jumping Channels A and B together on the connector block, and hook the intercom audio line to either terminal.

You might not want to commit yourself in the aforementioned manner to the use of one channel only; if so, and if one of the two channels does not receive a physical line feed, the station operator must remain switched to the active channel. If he switches to the unconnected channel, the station will exhibit disturbing oscillation. A solution to this would be channel termination: place a 200 ohm resistor across the input connector of the unused channel.

Consult Figure 3 for two examples of KB-111 Two-Channel Fixed Installation Wiring (next page).

The portable KB-111P is easy to interconnect within the intercom system; its rear panel provides one XLR-type, 3-pin female connector for the signal input and one XLR-type, 3-pin male connector for the signal extension to other stations.

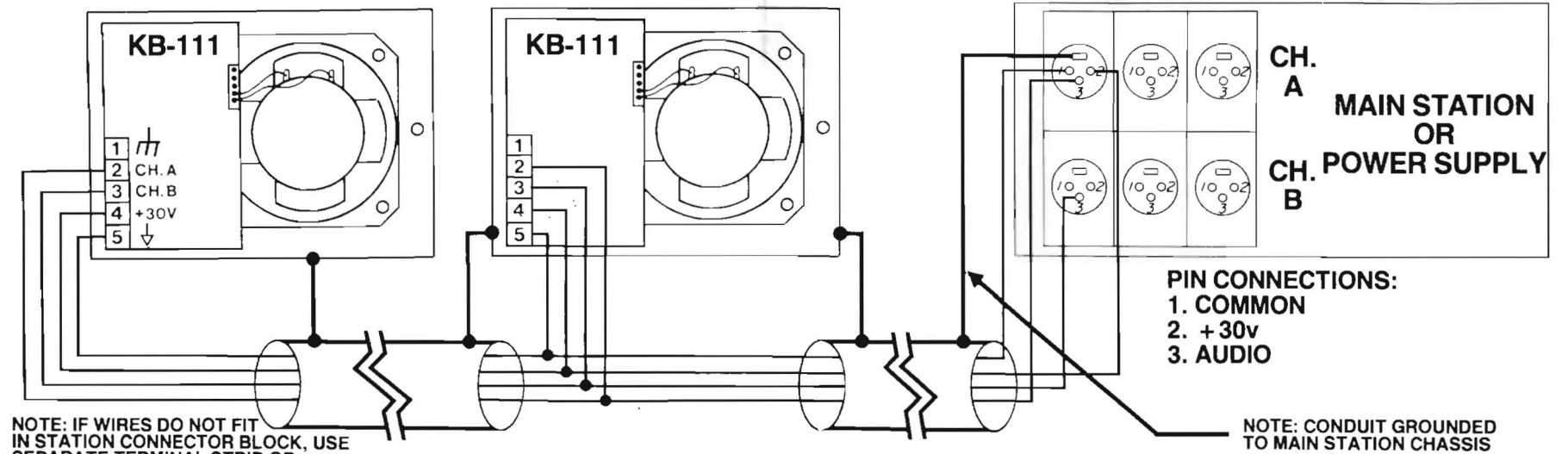
The KB-111P Station with the Two-Channel Option provides XLR-type, 6-pin female and male connectors for input and extension of the intercom signal.

Clear-Com can supply you with a handy interconnect device, the Model EC-5 Splitter. It allows you to use standard 3-pin mic cable for interconnecting a two-channel KB-111P. Provided on this device (which is a small box) are a pair of female 3-pin XLR-type connectors for the input of each channel line, leading to an internal loop-through. The "Splitter" then provides a 20' extension cable ending in a 6-pin connector, which simply plugs into the two-channel KB-111P. A pair of male 3-pin XLR-type connectors are also provided on the box, for extending the Channel A and B line feeds from the Splitter to other stations in the intercom system.

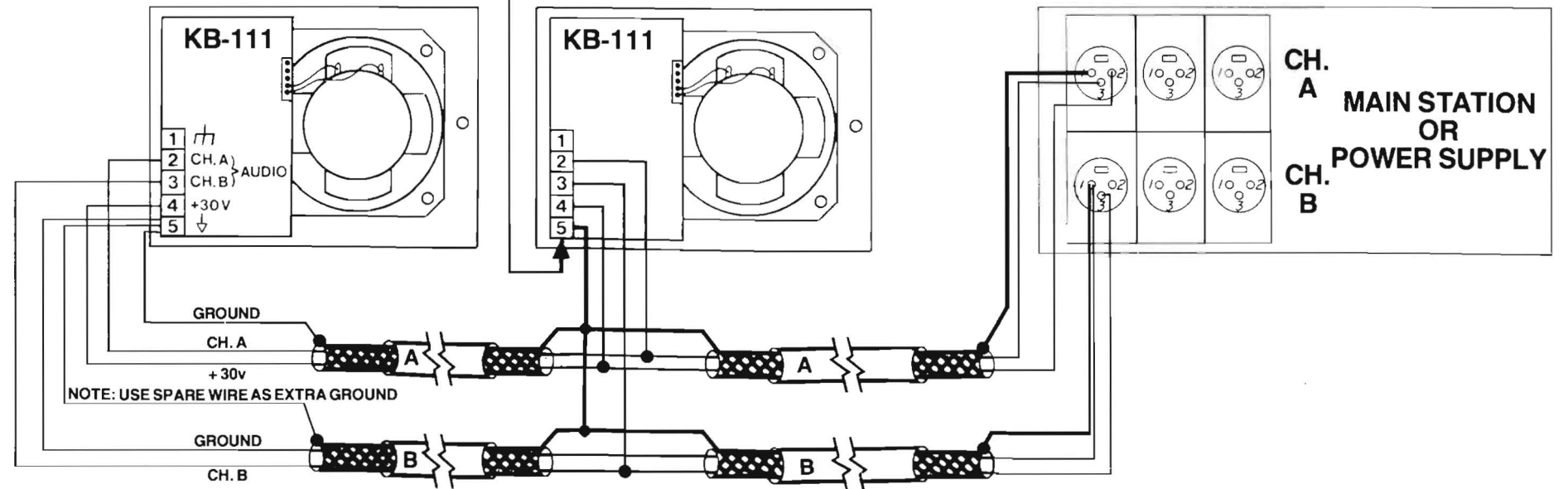
A diode in the DC input of each Remote Station protects the circuitry against miswiring in the interconnect cables. All Remote Stations bridge the terminated audio line with approximately 15k ohms.

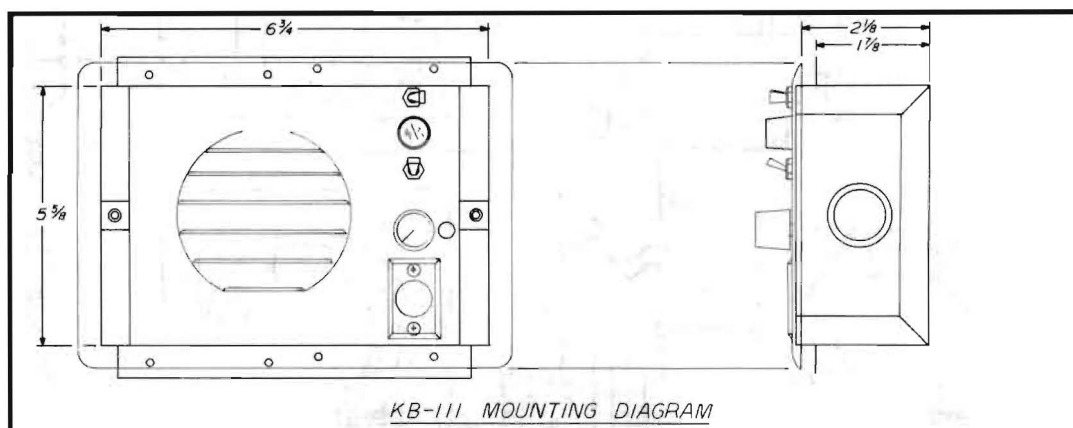
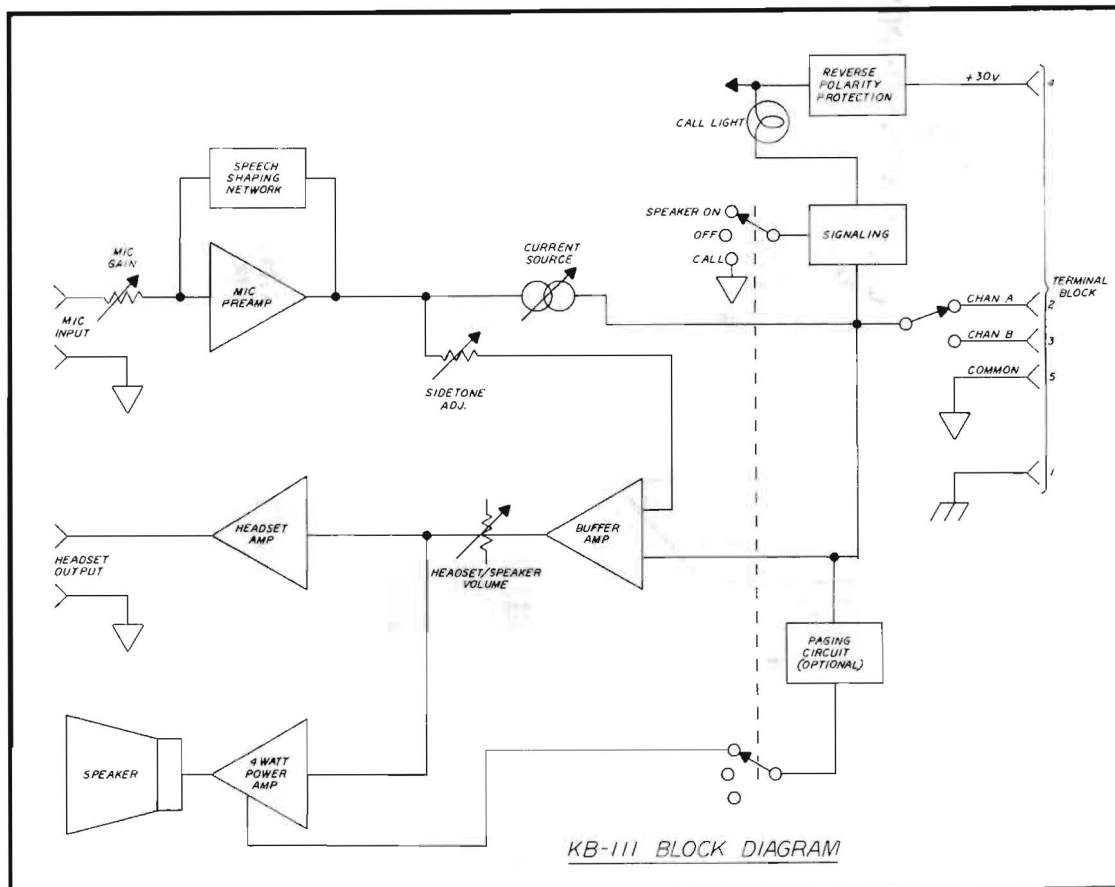
KB-111 FIXED INSTALLATION WIRING (TWO-CHANNEL)

METHOD I: 4 WIRES, UNSHIELDED IN CONDUIT



METHOD II: 2 2-COND., SHIELDED PAIR





BE SURE TO CONSIDER THE DIMENSIONS OF THE KB-111 FRONT PANEL/BACK BOX PLUS THE DEPTH OF SHEET-ROCK (IF ANY) BEFORE MOUNTING.

IF YOU INSERT TOO LONG A SCREW THROUGH THE HOLE IN THE RIGHT SIDE OF THE FRONT PLATE (AS SEEN FROM FRONT), IT WILL MAKE CONTACT WITH THE PC BOARD AND SHORT IT OUT. IT IS BEST TO USE THE SCREWS PROVIDED BY CLEAR-COM.

V. BUILT-IN MODIFICATIONS TO THE REMOTE STATION

Clear-Com's Remote Stations include optional functions which may be activated by the user (or by the factory if specified when ordering the Station).

Paging Option

This allows the KB-111/P to function as a headset intercom station that has a paging speaker. When a unit is modified as such, its speaker turns on when another station (on the same channel) activates the call signal; this allows verbal as well as visual signalling. The paging speaker will remain on as long as the other station's call button is pushed; at all other times the speaker is off. Headset operation is not affected by paging, which operates off the signalling circuit.

To accomplish this modification:

- 1) Cut out 47k ohm resistor R-24 (consult the diagram below for component location).
- 2) Remove SB-1 Jumper.

The result of these changes means that the speaker is OFF no matter what position the Speaker/Private/Call switch is in, and will come on only when another station activates the call signal.

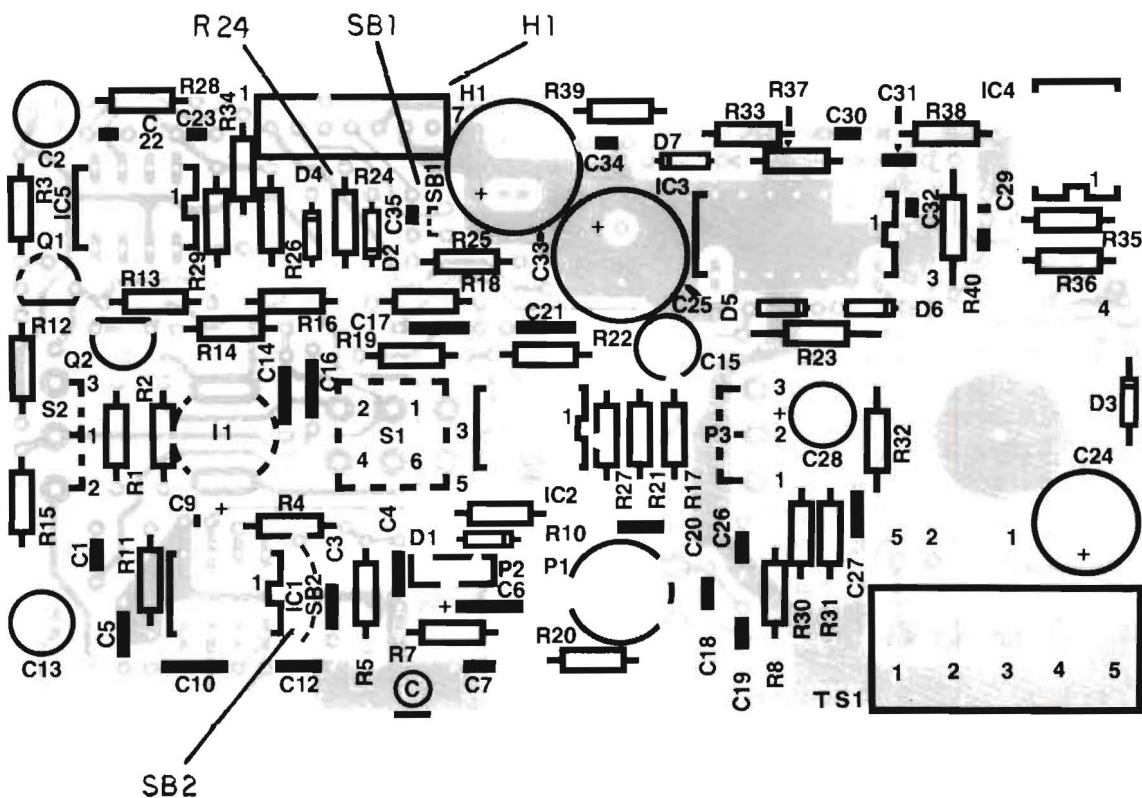
If, however, you'd prefer the speaker to remain ON when the switch is set to Speaker, and be a call-activated pager when the switch is set to Private, do NOT remove the SB-1 Jumper.

Optional Mic On/Off Switch

The Speaker/Private/Call switch can be changed to a Mic On/Mic Off/Call switch, where "Mic On" is the middle position, "Mic Off" is the up position, and the Speaker always remains on.

To achieve this change:

- 1) Solder a jumper on H-1 between Pin 2 and Pin 6.
- 2) Add jumper across location of SB-2.



VI. THEORY OF REMOTE STATION OPERATION

The KB-111 incorporates Clear-Com's high-impedance bridging method; therefore it connects to the intercom line without taking appreciable power from the line. This enables up to 20 Stations to be connected on the same line with only a 6 dB loss in audio level.

Each Remote Station consists of three basic circuits: the listen circuit, the talk circuit (including side tone control) and the signalling circuit.

In the LISTEN circuit, signals from the line and the mic pre-amp go to the buffer amp (where signals are amplified 10 dB), then to the volume control, and then to the headset amp for a final 30 dB of gain. Current-limiting in the headset protects it from shorts.

In the TALK circuit, signals from the mic are amplified 50 dB by a low-level pre-amp. Preamplified signals are sent to the audio line (where they are attenuated by 17 dB) and to the line buffer amp. The line buffer feeds part of the signal back to the bridging circuit, raising the line impedance to 15k ohms. When the mic is turned off or disconnected, the mic pre-amp gain is reduced to unity, reducing any noise in the input circuitry by

30 dB. An internal trimpot allows gain adjustment of the mic input by ± 10 dB. This control is set at the factory to give a standard level on the line, so all Clear-Com products will match.

The SIDE TONE control works by injecting a portion of the audio signal from the mic into the buffer amp. The mic pre-amp signal feeds through the side tone volume control and to the inverting input of the buffer amp. Cancellation occurs when the mic signal on the line and the signal from the side tone control are mixed into the buffer amp. The cancellation can be varied from full on to a 35 dB null.

The Visual CALL SIGNAL is accomplished by impressing DC voltage on the audio line. Pressing the CALL button turns on a transistor, applying about 11 volts to the audio line. This voltage goes to all Stations on the same channel, where the DC is detected by a high gain amp that turns on the CALL light. The call-receive circuit requires only 4 volts (at 100 ma) to turn on the light. The 7-volt difference between the send and receive voltages assures positive signalling, even on very long lines. Various capacitors block DC call voltage from entering the amp circuits.

VII. PARTS LISTING

Part #	Description	Qty.	Location/Schematic Reference Des.
710036	Printed Circuit Module	1	Internal
500000	Speaker, 4", 8 ohms	1	Front Panel (FP)/SP-1
210013	Headset connector, D4M	1	FP/J-3
240014	Knob, black, 3/4"	1	FP/P-2
390000	Lamp, amber	1	FP/I-1
510004	Switch, toggle, 3-pos	1	FP/S-1
510040	Switch, toggle, 2-pos	1	FP/S-2 (KB-111 only)
210002	Intercom connector, D3M	1	Side/J-2 (KB-111P only)
210003	Intercom connector, D3F	1	Side/J-1 (KB-111P only)
240003	Handle, strap	1	Top (KB-111P only)
240010	Rubber foot, 1/2" sq.	8	Back & Bottom (KB-111P only)

KB-111 SPECIFICATIONS

Amplifier Design

Solid-state, integrated circuit amplifiers with include a mic pre-amp, headset/speaker power amp, and signalling circuitry. Current-limited with short-circuit and reverse polarity protection.

Mic Preamplifier

Frequency Response: 250-12k Hz, with contoured response to enhance voice intelligibility.
Mic Input: 200 ohms
Mic Preamp Gain: 30 dB
Max. Input Before Clipping: -30 dB

Headphone Amplifier

Frequency Response: 150-18k Hz, ± 2 dB
Load Impedance Range: 300-2000 ohms
Output Level: +20 dBm, 26 volts p-p
@ 600 ohms
Headset Level: >110 dB with Clear-Com headsets
Distortion: 0.5% THD at 1 kHz
Headphone Amp Gain: 40 dB

Speaker Amplifier

Speaker Type: 4", 8 ohm, weather-proof
Power Output: 4 watts into 8 ohms
Frequency Response: 250-10k Hz, ± 3 dB
Speaker Level: >98 dB @ 3 feet

Connectors

Headset: Switchcraft type, D4M male
Line: KB-111-- 5 screw terminal block
KB-111P-- D3M male/D3F female

General Specifications

Line Level: -1 dB maximum
Sidetone Adjustment: 35 dB null to full on
Signalling Voltage: 11 volts DC on audio line
Call Light Sensitivity: 4 volts
Signal-to-Noise: 75 dB
Equivalent Input Noise: 121 dB
Station Bridging Impedance: >20k ohm (200-10k Hz)
Power Requirements: 20 ma quiescent, 60 ma average talk
60 ma signalling, 200 ma short-circuit
Voltage Range: 12-32 volts, 28 volts nominal
Physical Characteristics: KB-111--6.75" x 4.5" x 2.5" deep,
2 lbs, 12 oz.
KB-111P--8" x 5.3" x 2.5" deep,
3 lbs, 12 oz.

KB-111P with TWO-CHANNEL OPTION

If you have ordered the portable KB-111P with the two-channel option, connecting the Station within the intercom system is accomplished in the following manner:

The KB-111P-2CH provides 6-pin XLR-type connectors (two) for input and extension within the system. Connect the Station to other two-channel stations with a single multi-pair cable. We recommend Belden 8723 or the equivalent (22 gauge, 4-conductor). Please refer to the accompanying diagram,

The pin assignments on the 6-pin connectors are;

- Pin 1--Common
- Pin 2--DC, +30 volts
- Pin 3--Intercom Audio/Channel B
- Pin 4--Intercom Audio/Channel A
- Pin 5--No connection
- Pin 6--No connection

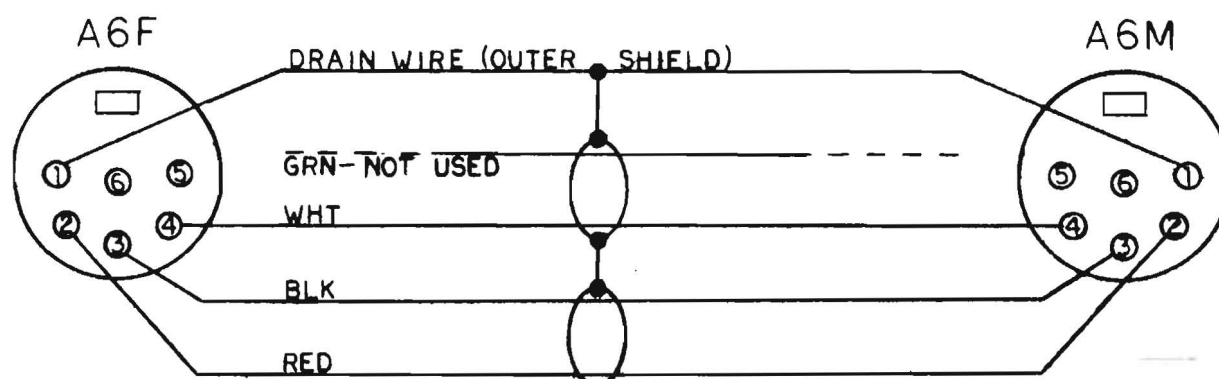
Interconnections between various two-channel Remote Stations can be accomplished by "daisy-chaining" them (the loop-through provided by each station's input and extension connectors allows you to set up many stations along one stretch of multi-pair cable).

Alternatively, you may avoid the use of multi-pair cable runs and interface the KB-111P with the two-conductor mic cable that connects directly to the Main Station/Power Supply. This is accomplished with Clear-Com's **EC-5 Cable Interface**. Housed in a small matte-black box, the EC-5 contains a pair of 3-pin input connectors (one per channel) and a 20' multi-pair cable ending with a 6-pin connector that simply plugs into the Station. The EC-5 also contains a pair of 3-pin extension connectors for daisy-chaining with other units.

The KB-111P-2CH provides a two-position toggle switch on the front panel labelled A/B. The position of this switch determines which channel the operator will use for communications.

NOTE: If the KB-111P-2CH only receives an input for one channel (i.e., only one intercom audio pin carries a signal, or only one channel line is input to the EC-5 Interface), the operator must remain switched to that active channel. If he/she switches to the unused channel, the Station will experience oscillation. A solution to this would be to put a 200 ohm terminating resistor across the input connector pin for the unused channel input.

2 CHANNEL INTERCONNECT CABLE



- CABLE IS 22-GAUGE, 2 PAIRS SHIELDED INDIVIDUALLY
(I.E. BELDEN 8723 or EQUIV.)
- PIN 1 - GROUND
- PIN 2 - +28 V
- PIN 3 - CH. B
- PIN 4 - CH. A
- PIN 5 } N/C
- PIN 6 }
- CH. A AND B WIRES MUST BE IN SEPARATE SHIELDED PAIRS

LAST RES. R40
LAST CAP. C35
LAST DIO. D7
○ CONNECTIONS TO PADS ON
P.C. BOARD

TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONS DEC ANGLES		 Clear-Com. intercom systems	
= ° ' "		SCHEMATIC KB-III, P SPEAKER STATION SYSTEM II	
APPROVALS	DATE	SCALE	SIZE
DRAWN <i>Smiles</i>	7/23/80	NONE	C
CHECKED N/A	7/23		DRAWING NO. KB-III-SSD-C-7
		DO NOT SCALE DRAWING	SHEET 1 OF 1

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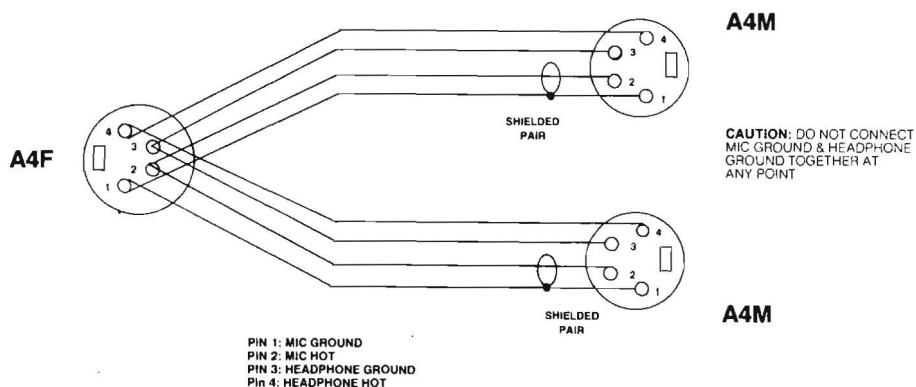
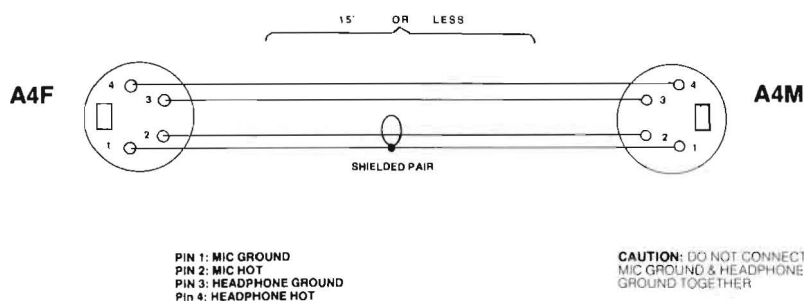


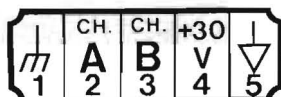
FIGURE 2: HEADSET EXTENSION CORD



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The portable KB-111P is easy to interconnect within the intercom system; its rear panel provides one XLR-type, 3-pin female connector for the signal input and one XLR-type, 3-pin male connector for the signal extension to other stations.

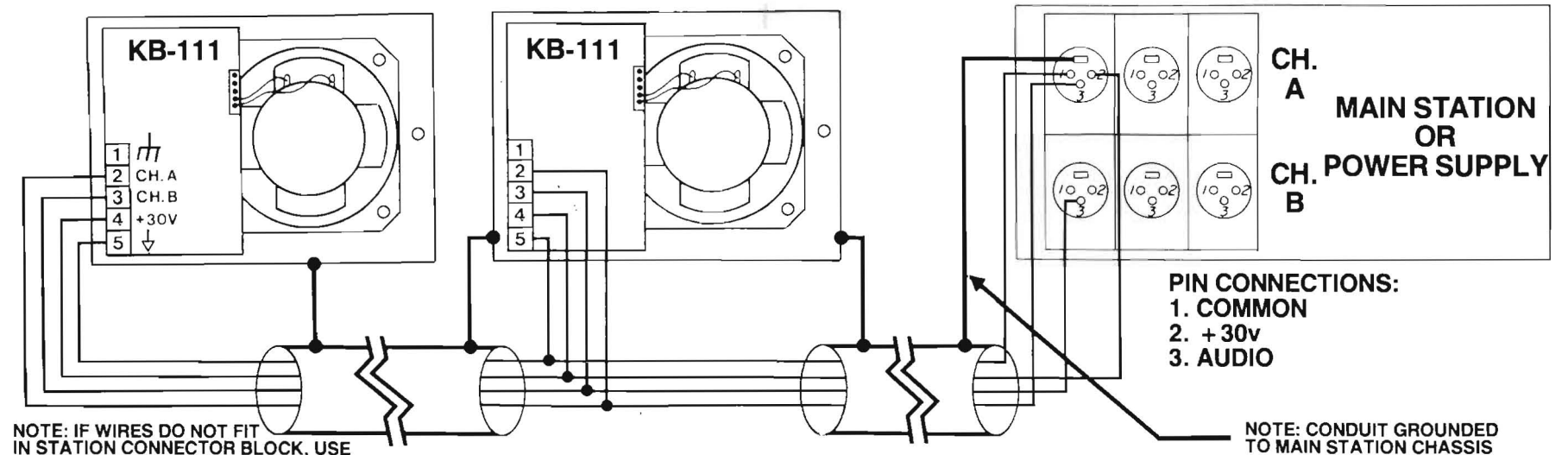
The KB-111P Station with the Two-Channel Option provides XLR-type, 6-pin female and male connectors for input and extension of the intercom signal.

Clear-Com can supply you with a handy interconnect device, the Model EC-5 Splitter. It allows you to use standard 3-pin mic cable for interconnecting a two-channel KB-111P. Provided on this device (which is a small box) are a pair of female 3-pin XLR-type connectors for the input of each channel line, leading to an internal loop-through. The "Splitter" then provides a 20' extension cable ending in a 6-pin connector, which simply plugs into the two-channel KB-111P. A pair of male 3-pin XLR-type connectors are also provided on the box, for extending the Channel A and B line feeds from the Splitter to other stations in the intercom system.

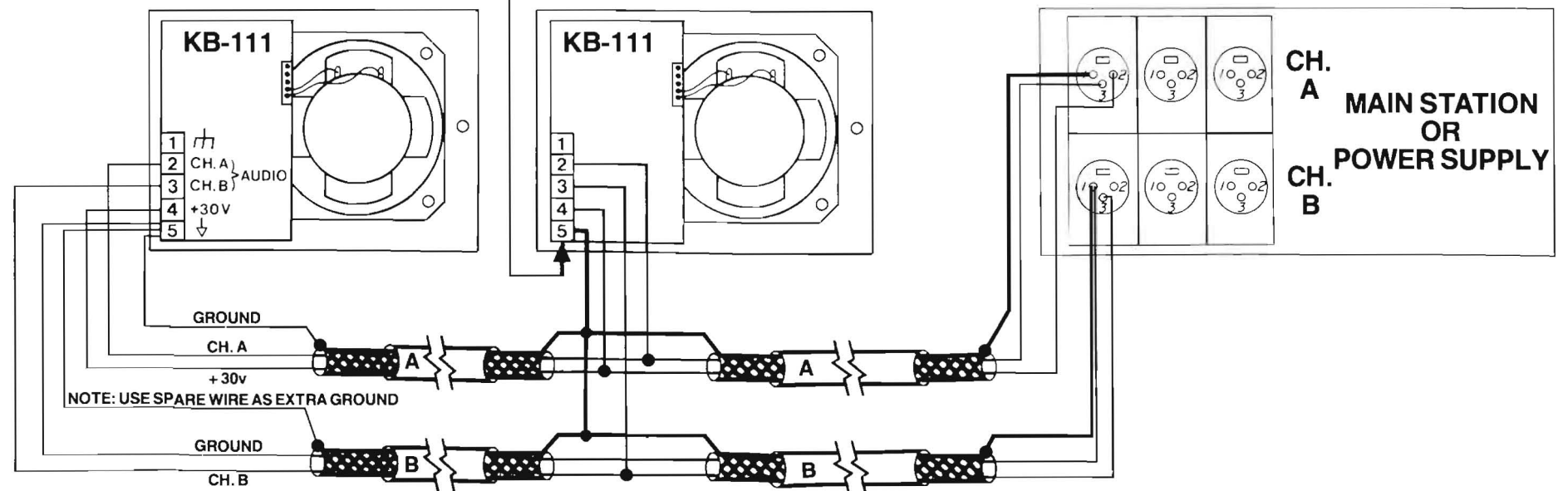
A diode in the DC input of each Remote Station protects the circuitry against miswiring in the interconnect cables. All Remote Stations bridge the terminated audio line with approximately 15k ohms.

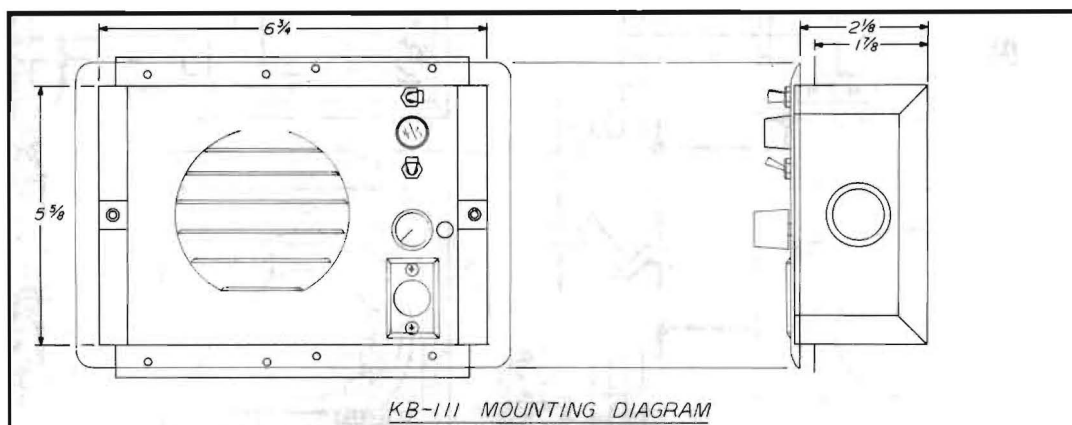
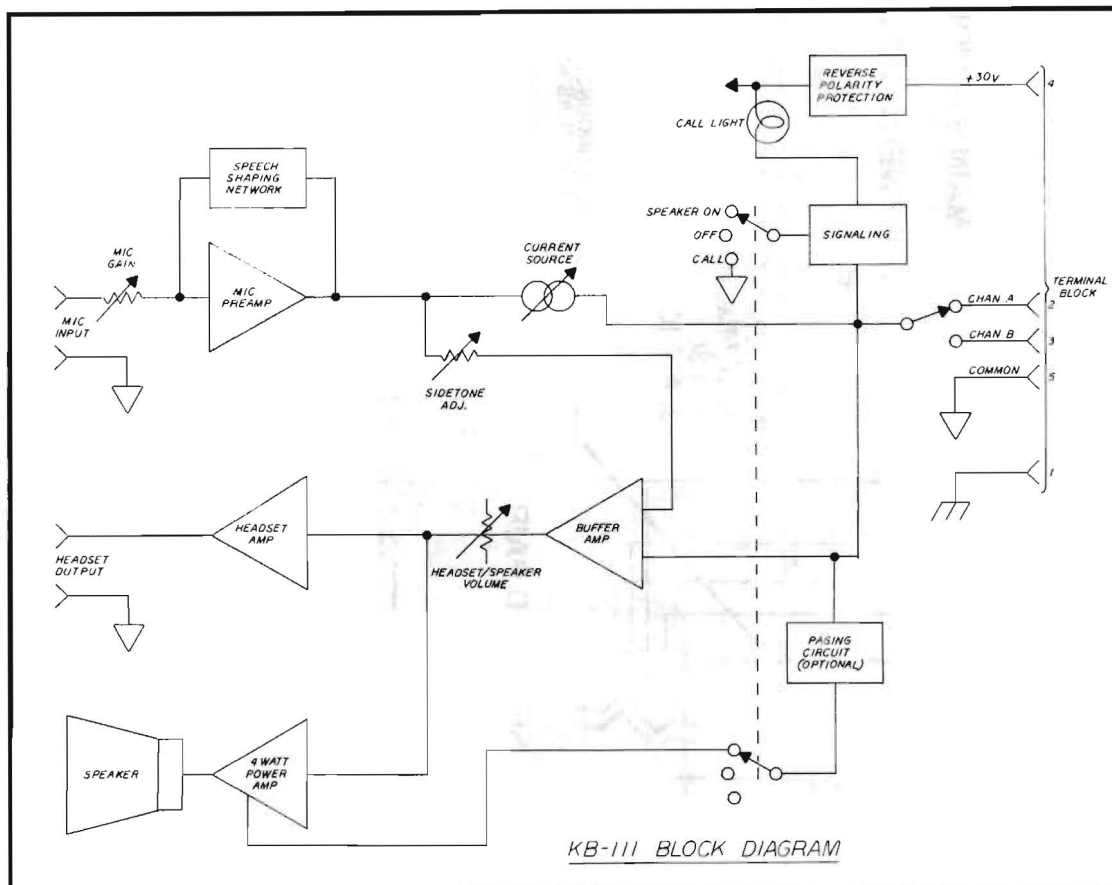
KB-111 FIXED INSTALLATION WIRING (TWO-CHANNEL)

METHOD I: 4 WIRES, UNSHIELDED IN CONDUIT



METHOD II: 2 2-COND., SHIELDED PAIR





BE SURE TO CONSIDER THE DIMENSIONS OF THE KB-111 FRONT PANEL/BACK BOX PLUS THE DEPTH OF SHEET-ROCK (IF ANY) BEFORE MOUNTING.

IF YOU INSERT TOO LONG A SCREW THROUGH THE HOLE IN THE RIGHT SIDE OF THE FRONT PLATE (AS SEEN FROM FRONT), IT WILL MAKE CONTACT WITH THE PC BOARD AND SHORT IT OUT. IT IS BEST TO USE THE SCREWS PROVIDED BY CLEAR-COM.

V. BUILT-IN MODIFICATIONS TO THE REMOTE STATION

Clear-Com's Remote Stations include optional functions which may be activated by the user (or by the factory if specified when ordering the Station).

Paging Option

This allows the KB-111/P to function as a headset intercom station that has a paging speaker. When a unit is modified as such, its speaker turns on when another station (on the same channel) activates the call signal; this allows verbal as well as visual signalling. The paging speaker will remain on as long as the other station's call button is pushed; at all other times the speaker is off. Headset operation is not affected by paging, which operates off the signalling circuit.

To accomplish this modification:

- 1) Cut out 47k ohm resistor R-24 (consult the diagram below for component location).
- 2) Remove SB-1 Jumper.

The result of these changes means that the speaker is OFF no matter what position the Speaker/Private/Call switch is in, and will come on only when another station activates the call signal.

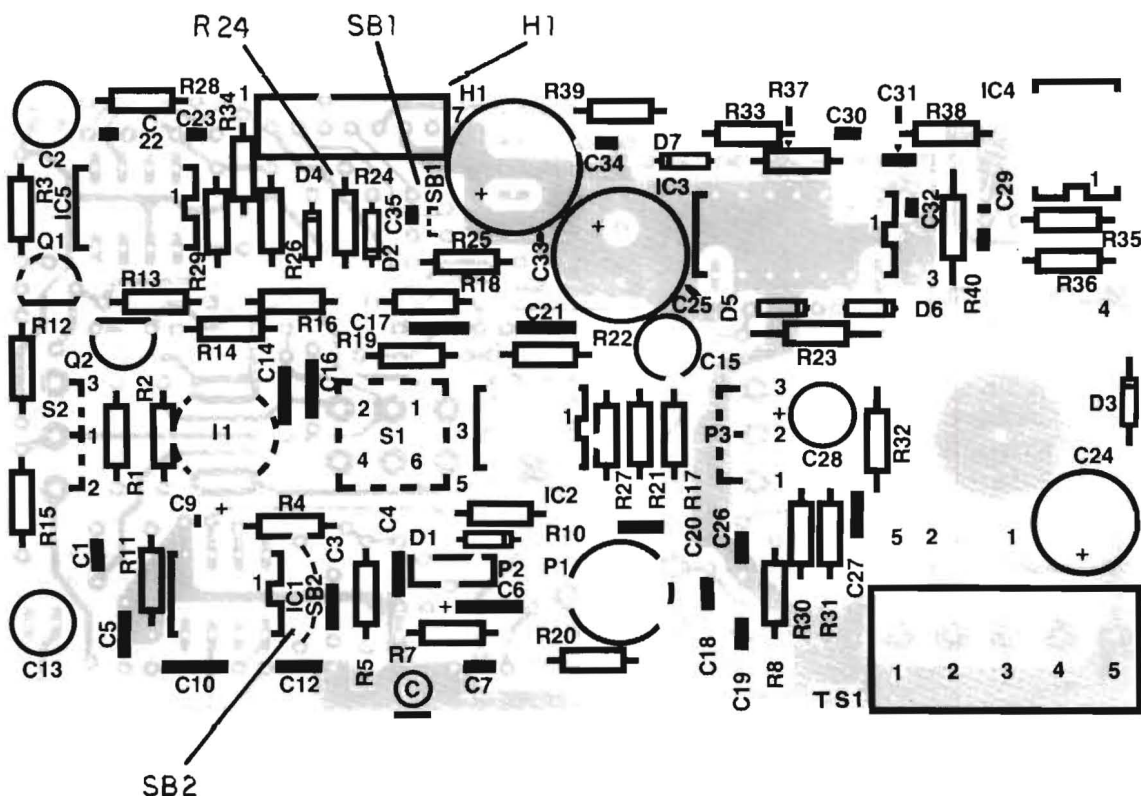
If, however, you'd prefer the speaker to remain ON when the switch is set to Speaker, and be a call-activated pager when the switch is set to Private, do NOT remove the SB-1 Jumper.

Optional Mic On/Off Switch

The Speaker/Private/Call switch can be changed to a Mic On/Mic Off/Call switch, where "Mic On" is the middle position, "Mic Off" is the up position, and the Speaker always remains on.

To achieve this change:

- 1) Solder a jumper on H-1 between Pin 2 and Pin 6.
- 2) Add jumper across location of SB-2.



VI. THEORY OF REMOTE STATION OPERATION

The KB-111 incorporates Clear-Com's high-impedance bridging method; therefore it connects to the intercom line without taking appreciable power from the line. This enables up to 20 Stations to be connected on the same line with only a 6 dB loss in audio level.

Each Remote Station consists of three basic circuits: the listen circuit, the talk circuit (including side tone control) and the signalling circuit.

In the LISTEN circuit, signals from the line and the mic pre-amp go to the buffer amp (where signals are amplified 10 dB), then to the volume control, and then to the headset amp for a final 30 dB of gain. Current-limiting in the headset protects it from shorts.

In the TALK circuit, signals from the mic are amplified 50 dB by a low-level pre-amp. Preamplified signals are sent to the audio line (where they are attenuated by 17 dB) and to the line buffer amp. The line buffer feeds part of the signal back to the bridging circuit, raising the line impedance to 15k ohms. When the mic is turned off or disconnected, the mic pre-amp gain is reduced to unity, reducing any noise in the input circuitry by

30 dB. An internal trimpot allows gain adjustment of the mic input by +/- 10 dB. This control is set at the factory to give a standard level on the line, so all Clear-Com products will match.

The SIDE TONE control works by injecting a portion of the audio signal from the mic into the buffer amp. The mic pre-amp signal feeds through the side tone volume control and to the inverting input of the buffer amp. Cancellation occurs when the mic signal on the line and the signal from the side tone control are mixed into the buffer amp. The cancellation can be varied from full on to a 35 dB null.

The Visual CALL SIGNAL is accomplished by impressing DC voltage on the audio line. Pressing the CALL button turns on a transistor, applying about 11 volts to the audio line. This voltage goes to all Stations on the same channel, where the DC is detected by a high gain amp that turns on the CALL light. The call-receive circuit requires only 4 volts (at 100 ma) to turn on the light. The 7-volt difference between the send and receive voltages assures positive signalling, even on very long lines. Various capacitors block DC call voltage from entering the amp circuits.

VII. PARTS LISTING

Part #	Description	Qty.	Location/Schematic Reference Des.
710036	Printed Circuit Module	1	Internal
500000	Speaker, 4", 8 ohms	1	Front Panel (FP)/SP-1
210013	Headset connector, D4M	1	FP/J-3
240014	Knob, black, 3/4"	1	FP/P-2
390000	Lamp, amber	1	FP/I-1
510004	Switch, toggle, 3-pos	1	FP/S-1
510040	Switch, toggle, 2-pos	1	FP/S-2 (KB-111 only)
210002	Intercom connector, D3M	1	Side/J-2 (KB-111P only)
210003	Intercom connector, D3F	1	Side/J-1 (KB-111P only)
240003	Handle, strap	1	Top (KB-111P only)
240010	Rubber foot, 1/2" sq.	8	Back & Bottom (KB-111P only)

KB-111 SPECIFICATIONS

Amplifier Design

Solid-state, integrated circuit amplifiers with include a mic pre-amp, headset/speaker power amp, and signalling circuitry. Current-limited with short-circuit and reverse polarity protection.

Mic Preamp

Frequency Response: 250-12k Hz, with contoured response to enhance voice intelligibility.

Mic Input: 200 ohms

Mic Preamp Gain: 30 dB

Max. Input Before Clipping: -30 dB

Headphone Amplifier

Frequency Response: 150-18k Hz, ± 2 dB

Load Impedance Range: 300-2000 ohms

Output Level: +20 dBm, 26 volts p-p
@ 600 ohms

Headset Level: >110 dB with Clear-Com headsets

Distortion: 0.5% THD at 1 kHz

Headphone Amp Gain: 40 dB

Speaker Amplifier

Speaker Type: 4", 8 ohm, weather-proof

Power Output: 4 watts into 8 ohms

Frequency Response: 250-10k Hz, ± 3 dB

Speaker Level: >98 dB @ 3 feet

Connectors

Headset: Switchcraft type, D4M male

Line: KB-111-- 5 screw terminal block
KB-111P-- D3M male/D3F female

General Specifications

Line Level: -1 dB maximum

Sidetone Adjustment: 35 dB null to full on

Signalling Voltage: 11 volts DC on audio line

Call Light Sensitivity: 4 volts

Signal-to-Noise: 75 dB

Equivalent Input Noise: 121 dB

Station Bridging Impedance: >20k ohm (200-10k Hz)

Power Requirements: 20 ma quiescent, 60 ma average talk
60 ma signalling, 200 ma short-circuit

Voltage Range: 12-32 volts, 28 volts nominal

Physical Characteristics: KB-111--6.75" x 4.5" x 2.5" deep,
2 lbs, 12 oz.
KB-111P--8" x 5.3" x 2.5" deep,
3 lbs, 12 oz.

KB-111P with TWO-CHANNEL OPTION

If you have ordered the portable KB-111P with the two-channel option, connecting the Station within the intercom system is accomplished in the following manner:

The KB-111P-2CH provides 6-pin XLR-type connectors (two) for input and extension within the system. Connect the Station to other two-channel stations with a single multi-pair cable. We recommend Belden 8723 or the equivalent (22 gauge, 4-conductor). Please refer to the accompanying diagram,

The pin assignments on the 6-pin connectors are;

- Pin 1--Common
- Pin 2--DC, +30 volts
- Pin 3--Intercom Audio/Channel B
- Pin 4--Intercom Audio/Channel A
- Pin 5--No connection
- Pin 6--No connection

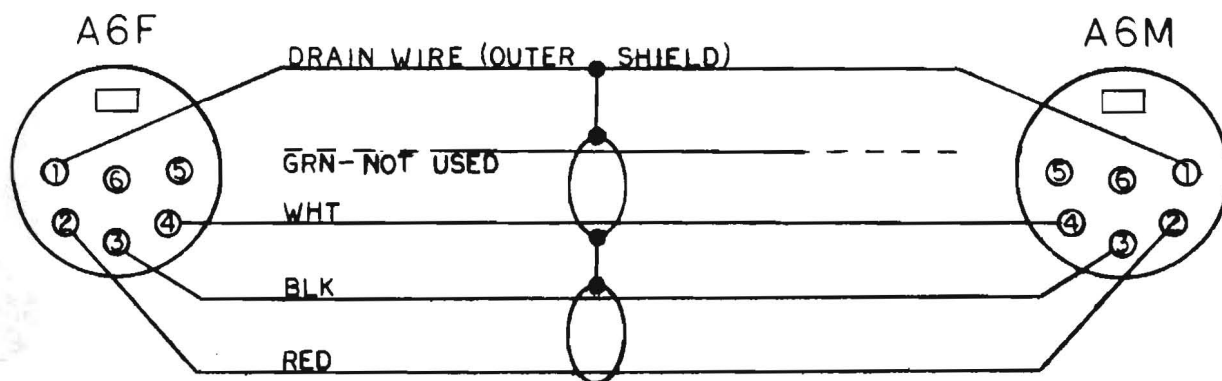
Interconnections between various two-channel Remote Stations can be accomplished by "daisy-chaining" them (the loop-through provided by each station's input and extension connectors allows you to set up many stations along one stretch of multi-pair cable).

Alternatively, you may avoid the use of multi-pair cable runs and interface the KB-111P with the two-conductor mic cable that connects directly to the Main Station/Power Supply. This is accomplished with Clear-Com's EC-5 Cable Interface. Housed in a small matte-black box, the EC-5 contains a pair of 3-pin input connectors (one per channel) and a 20' multi-pair cable ending with a 6-pin connector that simply plugs into the Station. The EC-5 also contains a pair of 3-pin extension connectors for daisy-chaining with other units.

The KB-111P-2CH provides a two-position toggle switch on the front panel labelled A/B. The position of this switch determines which channel the operator will use for communications.

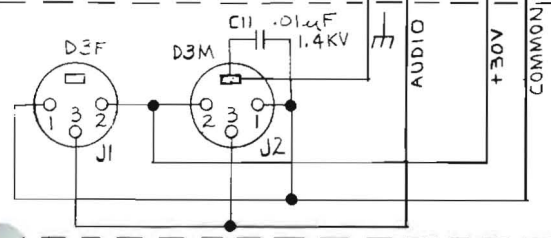
NOTE: If the KB-111P-2CH only receives an input for one channel (i.e., only one intercom audio pin carries a signal, or only one channel line is input to the EC-5 Interface), the operator must remain switched to that active channel. If he/she switches to the unused channel, the Station will experience oscillation. A solution to this would be to put a 200 ohm terminating resistor across the input connector pin for the unused channel input.

2 CHANNEL INTERCONNECT CABLE




- CABLE IS 22-GAUGE, 2 PAIRS SHIELDED INDIVIDUALLY
(I.E. BELDEN 8723 or EQUIV.)
 - PIN 1 - GROUND
 - PIN 2 - +28V
 - PIN 3 - CH. B
 - PIN 4 - CH. A
 - PIN 5 } N/C
 - PIN 6 }
- CH. A AND B WIRES MUST BE IN SEPARATE SHIELDED PAIRS

NOTE:
CONNECTORS
USED ON KB-III
ONLY.



LAST RES. R40
LAST CAP. C35
LAST DIO. D7
○ CONNECTIONS TO PADS ON
P.C. BOARD

TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONS DEC ANGLES ± ± ± ± ±		 Clear-Com. intercom systems	
SCHEMATIC KB-III, P SPEAKER STATION SYSTEM II			
APPROVALS	DATE	SCALE	SHEET
DRAWN <i>Smith</i>	7/23/80	NONE	DRAWING NO. KB-III-SSD-C-7
CHECKED <i>NY</i>	7-23	DO NOT SCALE DRAWING	SHEET 1071

CS 200

CLEAR-COM

INSTRUCTION AND SERVICE MANUAL

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SECTION I

INTRODUCTION

1.1 GENERAL

The Clear-Com system is a closed circuit intercommunication system designed for clear, two-way communication in all environments. The basic system consists of either a main control station, or power supply. Up to 100 remote stations can be interconnected on over 1 mile of cable maintaining system specifications. All stations are interconnected with 2 conductor shielded microphone cables using XLR type 3 pin audio connectors. There are several different interchangeable remote stations available: the RS-100A "belt pack" headset station, the MR-102 "wall mount" headset station and several different speaker stations including a hands free portable speaker station. Other special purpose stations are also available. These include paging speaker stations, multiple channel switchboards, interfacing adapter for connecting Clear-Com to telco lines or other intercom systems, 2 channel split headphone belt packs with separate program, remote station module kit, and a battery adapter. A full line of accessories are available including wall plates, microphones, headsets, telephone type handsets, interconnecting cable and splitters. Specific instructions regarding these individual stations are included with the product.

THEORY OF OPERATION

Clear-Com is a distributed amplifier system, with each remote station housing its own mic preamplifier and headset power amplifier. The main control station/power supply delivers the dc voltage necessary to operate all the remote stations. It also terminates the audio line for the entire system. Low impedance lines (200 ohms) and specially designed audio circuitry make the system virtually immune to RF and dimmer noise. The main control station or power supply delivers 28 vdc which is carried to the remote stations via the same interconnecting cable which carries the audio signals. Main stations and remote stations all have the following common features: The mic preamp automatically shuts off when the station microphone or headset is disconnected. The visual signaling circuit operates by impressing a dc voltage on the audio line. The main station and power supplies also have an auxiliary line level input with its own volume control which allows mixing of an external program with the intercom line. This is useful for program monitoring. All remote stations have adjustable side tone. This enables the user to vary the level of their voice in the headset, handset or speaker for maximum intelligibility and to minimize the possibility of feedback. Other features include a volume control for adjusting the level in the earphones, mic on-off-call switch.

SECTION II

INSTALLATION

2.1 EQUIPMENT SELECTION

2.1.1 FIXED SYSTEM MAIN STATIONS

For permanent intercom systems, main station equipment is usually mounted in a standard 19" rack for security and convenience. For this reason, we recommend the CS-200K dual-channel main station. However, if an intercom station is not needed at the area where the equipment rack is located, then the two channel PS-451 power supply or the single channel PS-10K power supply (without intercom station) can be substituted.

2.1.2 FIXED SYSTEM REMOTE STATIONS

In permanent installations, it is usually desirable to run interconnecting cables through conduits, and to bring them to wall-mounted remote stations, or to wall plates for connection to portable remote stations. We recommend the MR-102 II wall-mount remote station, or the KB-111 wall-mount remote station. If you don't wish to have the remote station built into the wall, then use our WP-2 wall plate with any of our portable remote stations.

2.1.3 PORTABLE SYSTEM MAIN STATIONS

For portable intercom systems, main station equipment must be compact, lightweight, and easily moved for storage.

2.1.4 PORTABLE SYSTEM REMOTE STATIONS

The RS-100A "belt pack" is the key to our truly flexible portable intercom system. Because each RS-100A has a pair of input and extension connectors, many stations may be "daisy chained" together along one interconnect path. This saves cable and simplifies installation and break down.

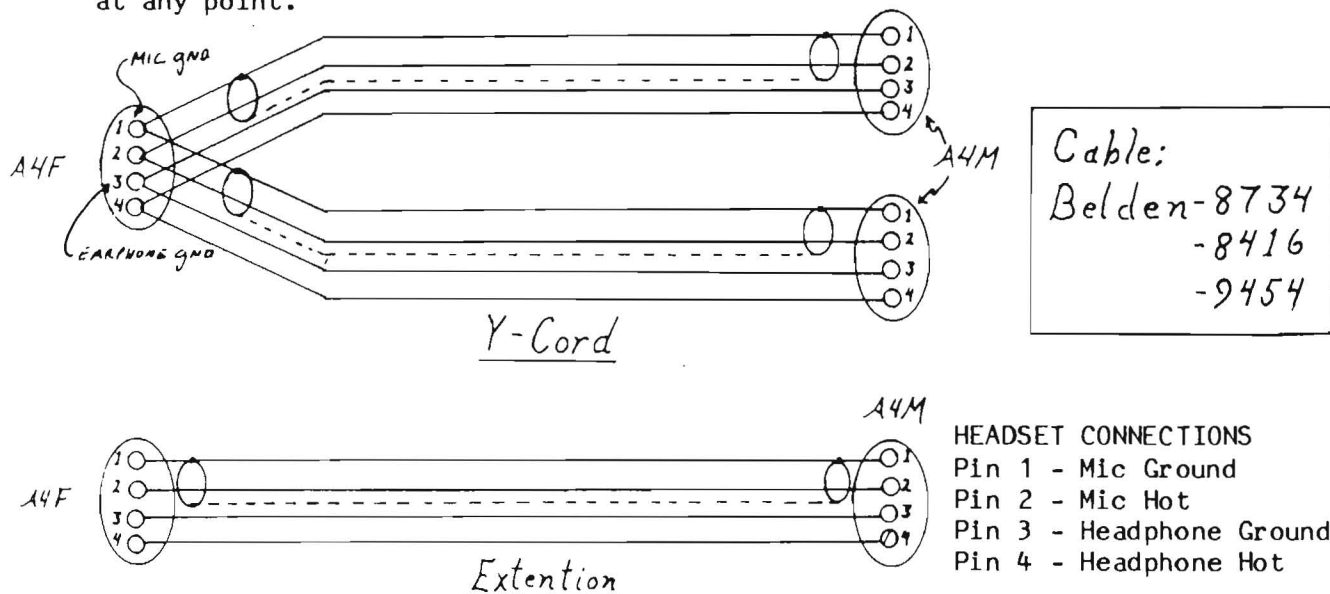
A two channel version is available in both monoaural and binaural output allowing simultaneous monitoring of both Channels A & B with the RS 202M or RS 202S. Portable speaker stations include the KB-111P with PT/4 (Push to talk mic) or Hands-Free KB -124 with built-in mic. Both products are ideal for use in remote trucks, studio control rooms, flyrail and other locations where a headset with boom mic would be impractical.

2.1.5 CLEAR-COM HEADSETS, HANDSETS, AND PUSH TO TALK MICS

Clear-Com has three standard headsets available, all with boom-mounted, noise-cancelling microphones. The CC-240 is a double-muff headset, and the CC-75 is a single-muff headset, both with boom-activated mics. The PH-7 is a double-muff headset which has wider frequency response, greater isolation from ambient noise, and sturdier physical construction than the CC-240, and no mic switch in the boom. All units have field-replaceable cords. The HS-6 telephone-style handset is interchangeable with the above headsets.

All remote stations can drive two (2) headsets with only a slight reduction in level. A Y-cord can be made up using the diagram below and the specified wire. Extension cords for the headset can also be made out of this same cable or other separately shielded cable such as Belden 8734, 8416 or 9454. Extensions should be limited to approximately 15' due to the possibility of capacity coupling between the microphone signal and the headset signal which would cause a loss of high frequency response or oscillation.

CAUTION: DO NOT connect microphone ground and earphone ground together at any point.



2.1.6 OTHER HEADSETS

Non-Clear-Com headsets are available from Clear-Com or local dealers. These are recommended for special applications:

- | | |
|--------------|---|
| Beyer DT-108 | Single-Muff, high-fidelity earpiece with boom mic; may be used for monitoring and intercom. |
| Beyer DT-109 | Double-Muff, high fidelity earphone with boom mic; may be used for monitoring and intercom. |

2.1.6 INTERFACE TO OTHER COMMUNICATION SYSTEMS

The AC-10 Adapt-a-Com is a universal adapter which enables Clear-Com to be interfaced with any other intercom or communications link. When existing non-Clear-Com installations are being upgraded to Clear-Com equipment, portions of the older system can be retained. Since Adapt-a-Com works in 2-, 3- and 4-wire systems, it virtually guarantees compatibility with any house intercom equipment.

Because it will simulate a carbon mic, Adapt-a-Com can be plugged into the headset jack on a TV camera, control unit, or other 2-wire systems. Adapt-a-Com operates with telephone company and competitive model 3-wire intercoms, facilitates on-line intercom via standard telephone systems, and aids in direct communication between the studio and remote locations via 2 or 4 wire dedicated TEL. CO. pairs.

2.1.7 AUDIO ISOLATION OF PARTS OF THE INTERCOM SYSTEM

In certain applications, it may be desirable to isolate conversations in one section of the system. In these instances, the BA-1 in-line isolator may be used to block audio while allowing power to flow to the isolated leg of the system. This inexpensive, passive device creates a quasi-dual channel system from a single channel, except that the main station cannot contact or be called by the isolated leg of the system. The BA-1 enables you to have private local conversations along a common interconnect cable without need for multiple cabling or several main stations. Any number of BA-1's may be used, so long as the power capacity of the main station is not exceeded.

2.2 MAXIMUM NUMBER OF STATIONS AND CABLE CONSIDERATIONS

2.2.1 MAIN STATION CURRENT AND IMPEDANCE LIMITS

The Clear-Com CS-200 main station and the PS-451 power supply have the same maximum output current capacity of 2 amps. For both stations, the total current draw on both channels cannot exceed 2 amps.

The Clear-Com PS-10 power supply has a maximum output of 0.6amps.

Due to impedance considerations, regardless of the cable lengths or mix of remote stations, forty (40) stations are the maximum that can be driven from one main station. The PS-10 can only support approximately 12. (With certain stations, it may be possible to use more than forty (40) stations; contact the factory for details.)

2.2.2 CALCULATING THE MAXIMUM NUMBER OF REMOTE STATIONS

In installations with less than 500 feet total interconnecting cable, only the remote station current requirements need be considered. One main station will support up to forty (40) RS-100A or MR-102 remote stations, or up to fifteen (15) KB-100 or KB-111 remote stations.

When calculating the maximum current drain, only two figures need be considered; a maximum current drain of 40ma in the RS-100A or MR-102, and an average current drain of 130ma in the KB-100 or KB-111, Thus, an equation for maximum stations would be as follows:

$$X = \text{Number of RS-100A's} + \text{MR-102's} \leq 40.$$

$$Y = \text{Number of KB-100's} + \text{KB-111's} \leq 15.$$

Therefore,

$$\begin{array}{ll} \text{CS-200 or PS-451} & 0.04X + 0.13Y \leq 2.0\text{amps} \\ \text{PS-10} & 0.04X + 0.13Y \leq 0.6\text{amps} \end{array}$$

2.2.3 CABLES

Where cable lengths greater than 500 feet are involved, the maximum number of remote stations, depends on four factors; the current requirements of each remote station, the length of the wire, the wire gauge, and the cable capacitance. In all instances, 2-conductor, shielded interconnecting cable should be used.

A. PORTABLE INSTALLATIONS: rubber-installed and jacketed cable should be used due to its superior strength and durability. Belden 8413 miniature cable (24 ga. stranded conductors) is usable up to 500 feet. Belden 8412 (20 ga. stranded conductors) is usable up to 5,000 feet.

B. PERMANENT INSTALLATIONS: Vinyl-insulated and jacketed cable may be used; it costs less and is easier to pull through conduit than rubber insulated types. However, low capacitance cable must be used. Belden 8762 (20 ga. stranded conductors) is usable up to 500 feet. Belden 8670 (18 ga. stranded conductors) is usable up to 5,000 feet. NOTE: In systems where conduit is not used, and where equipment may not share a common ground, it may be necessary to run an additional ground wire to tie chassis together. This may be accomplished with Belden 8770 3-conductor shielded cable.

C. 2-CHANNEL PERMANENT INSTALLATIONS: Permanent systems can be wired in one of two ways. First, Channel A and Channel B may be routed to two distinct areas, for use by different people. Second, both channels may be routed together and brought to WP-2 wall plates so the user can select either channel A or B. The second method can be wired with two 2-conductor shielded cables or one multi-pair shielded cable.

Cables equivalent to the Belden types may be used, so long as their capacitance and wire gauge are comparable. Particularly in longer runs, it is desirable to use cable which has low resistance (large diameter conductors) and low inter-conductor capacitance.

2.3 LAYING OUT THE SYSTEM

2.3.1 PORTABLE INSTALLATIONS

Having determined the number and type of remote stations you wish to use, decide on a location for the main station or power supply. It should be near a source of 115V AC (power consumption is approximately 80 watts.) Route all cables from the remote stations to the main station or power supply. The routing can be in any way that is convenient to the installation. Individual stations can be brought to the main station and then paralleled if there is not enough connectors on the main station or the remote stations can be "daisy chained" together.

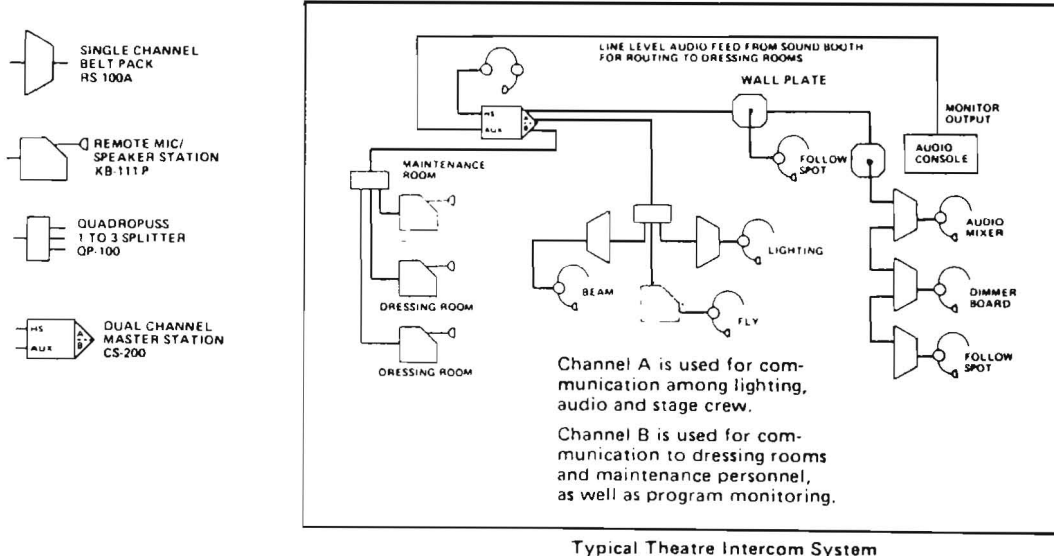
Additionally, remote stations can be added by "daisy chaining" them to one another and/or by using the OP-100 Quadrapuss splitter. Cables should be routed away from heavy AC power sources, such as lighting panels, electric motors, etc.

2.3.2 PERMANENT INSTALLATIONS

The same general considerations apply here as for portable systems, as described in the preceding paragraph. Additionally, cables should be installed in accordance with approved local building codes. Class II wiring may be used. Connections to wall-plates or wall-mount remote stations are shown in the diagrams.

2.3.3 ISOLATED CHANNELS

The BA-1 In-Line Isolator can be installed anywhere in the system. For example, plug it into one output connector on the rear panel of the main station to create an entire isolated channel. Alternately, plug it into a remote station at the end of a cable run to isolate further remote stations while using a minimum of additional interconnect cable.



Typical Theatre Intercom System

SECTION III
OPERATION OF THE CS-200

3.1 DESCRIPTION OF CS-200

The CS-200 is a 2-channel intercom main station with built-in power supply. It can deliver up to 2 amps at 28 volts to operate the intercom system. The main station also supplies the termination for both intercom channels. A circuit breaker (with front-panel short indicator) disconnects power to all remote stations in the event of a short circuit in the intercom line. An internal fuse protects the system from damage in case of possible power supply failure. Monitoring the two channels is accomplished with the front panel lever switch selecting channels A, B or A+B (both). In the A+B position, the operator can communicate with both channels simultaneously without combining the channels. A mic on-off switch and headset volume control complete the monitoring section. There are two signalling lamps, one for channel A and one for channel B. When a remote station signals the operator, the appropriate lamp will light regardless of the position of the monitor select switch. When the operator wishes to signal a remote station, the call button is pressed signalling those remote stations on channels selected by the monitor switch. The main station also has an auxiliary, line-level input with its own volume control that allows mixing of an external program with the intercom line. The front panel provides a three pin XLR-type connector for the aux input & two parallel XLR-type 4 pin connectors for headsets. Six XLR-type 3 pin connectors are provided on the back panel for remote station interconnect. Three for channel A and three for channel B.

NOTE: The CS-200 does not have a side tone adjustment.

CAUTION:

- A) DO NOT allow belt packs to come into contact with other pieces of electrical equipment. An improper ground or short in a piece of electrical equipment touching a Clear-Com remote station can cause a hum or a buzz in the system. When connecting remote stations to electrical equipment, make sure the equipment is properly grounded.
- B) DO NOT wear the remote stations in wet weather without ensuring that the station is properly grounded.

3.2 OPERATION OF THE CS-200

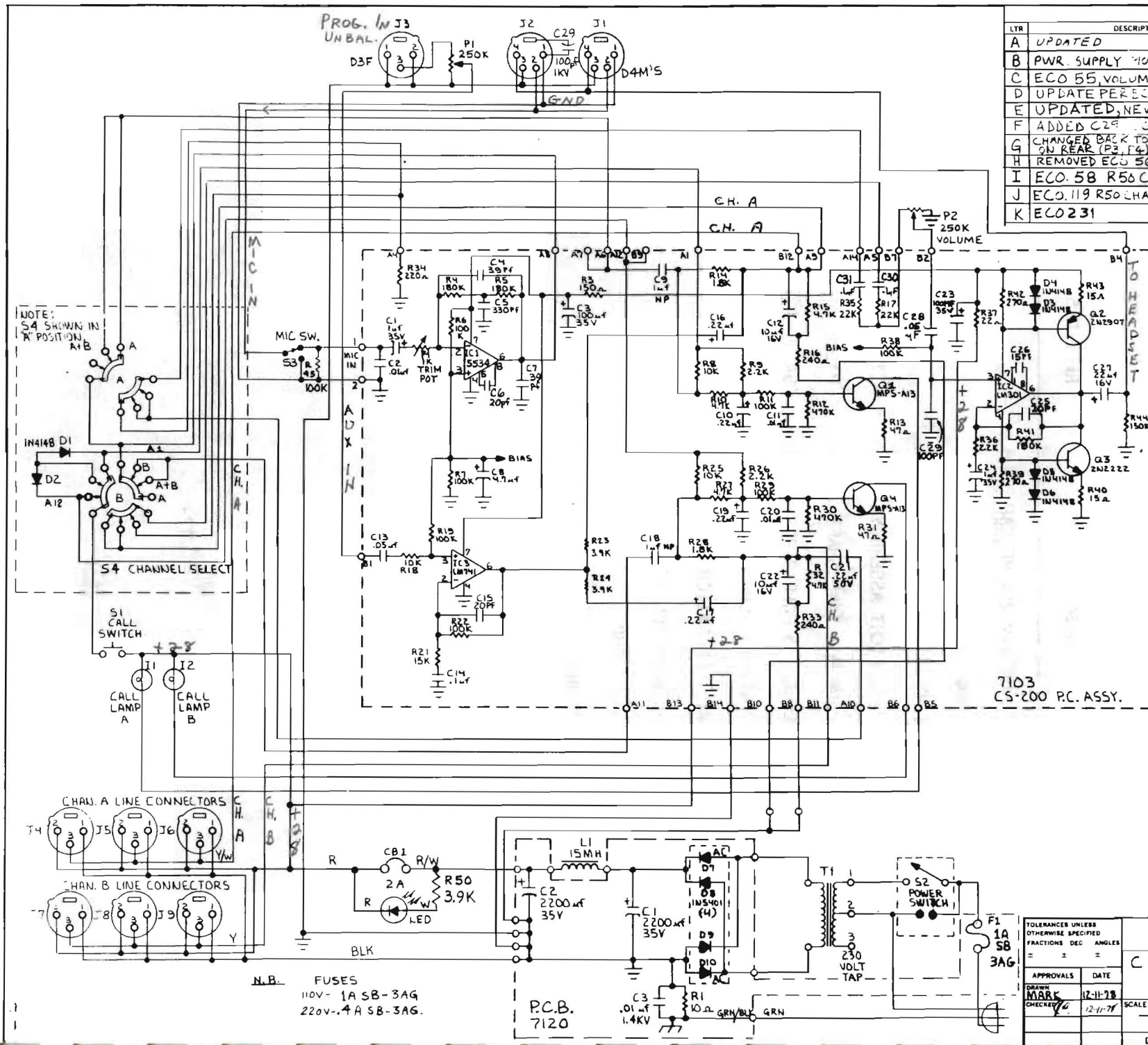
(See illustration on next page)

OPERATION OF THE CLEAR-COM SYSTEM IS QUITE SIMPLE, AS FOLLOWS:

1. CONNECT CS-200 MAIN STATION to all stations with interconnecting cable. Determine which stations are going to be on channel A and which are going to be on Channel B. Plug cable into appropriate connector. NOTE: Before connecting cables on rear panel shut power off and hold call button depressed until call light(s) go out.
2. PLUG IN HEADPHONES at main station and remote stations into HEADSET CONNECTORS at front panel. (To locate connectors and controls, see illustration on next page) Headset connectors in main station are wired in parallel. Use one or both. A MICROPHONE ON/OFF switch switches off the mic on both headset connectors.
3. SET MASTER GAIN CONTROLS on rear panel of main station for over-all system level or to compensate for number of remote stations in system. The CS-200 has one gain control for each channel. Under high noise conditions, turn master gain DOWN and speak with microphone very close to the mouth.
4. PLUG IN POWER CORD to a 115 AC circuit. Turn on power switch. The power switch should now illuminate.
5. SET HEADSET VOLUME CONTROLS at main station and remote stations for individual volume level. Volume controls are located on front panel.
6. TO SIGNAL stations where headphones may have been removed, press CALL BUTTON on front panel and CALL LIGHT will go on. Call lights light up at all stations simultaneously as long as button is depressed. The channel that you are signaling is determined by the position of the CHANNEL SELECT switch.
7. THE AUXILIARY INPUT CONNECTOR on the front panel of the main station provides for external program to be fed into the entire system. (See schematic for connecting details). The AUXILIARY VOLUME CONTROL is located directly on top of the auxiliary input connector and controls the auxiliary input volume to the system. This input is unbalanced.

SECTION V
CS-200 PARTS LIST

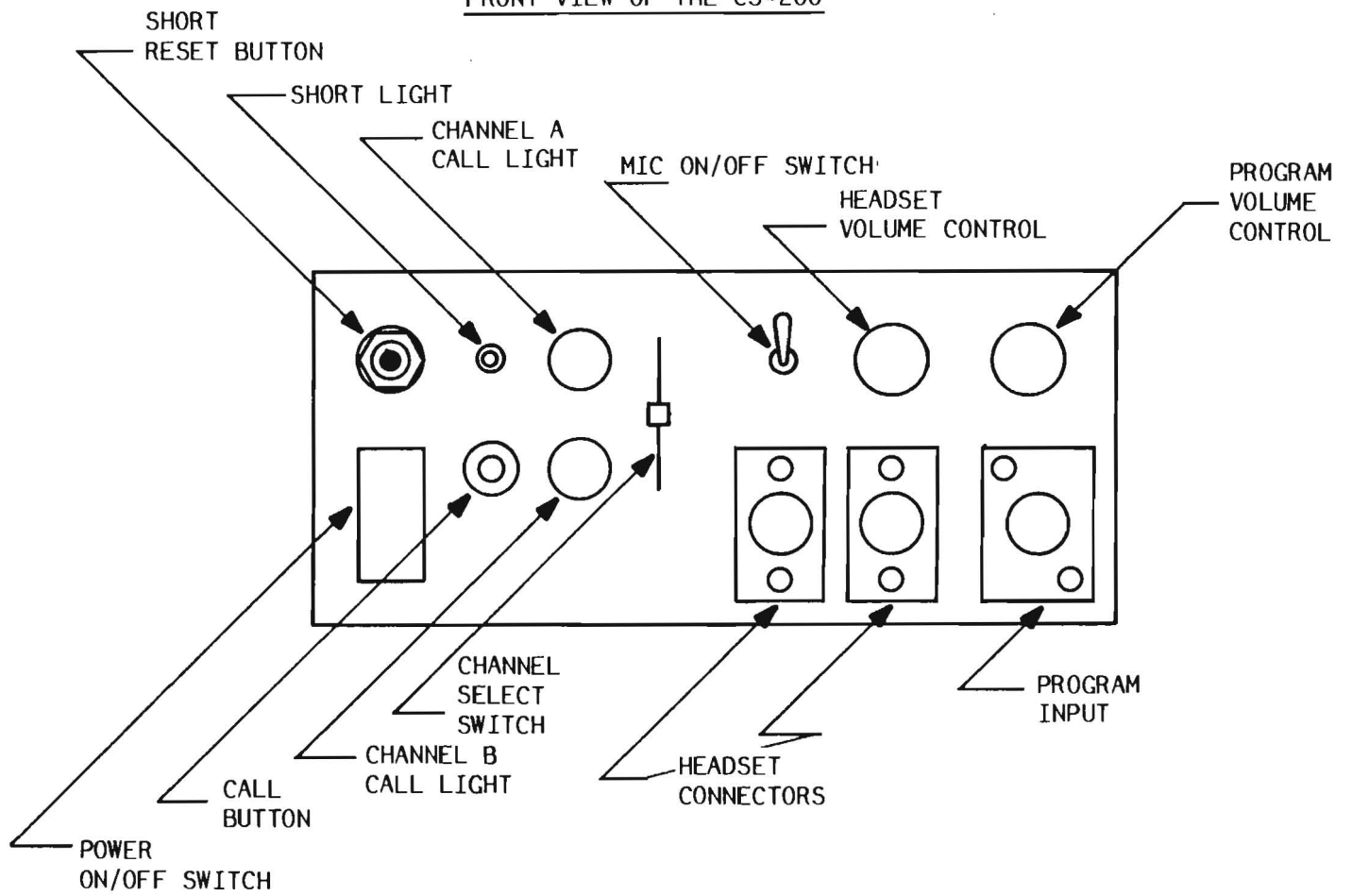
ITEM	PART #	DESCRIPTION	REF. DES.	QTY.
1	150048	100PF 1KV 20% RF CAP		1
2	240013	KNOB		2
3	240002	FEET		4
4	300000	CALL LIGHT ASSEMBLY	I1, I2	2
5	470001	250K POT 1/4" SHAFT	P1, P2	2
6	710112	LEVER, 5 POLE 3-POS ASS'Y	S4	1
7	510002	POWER SWITCH	S2	1
8	510006	MIC OFF SWITCH	S3	1
9	510012	PUSH BUTTON	S1	1
10	520021	3AG 1 AMP S.B.		1
11	520013	2 AMP CIRCUIT BREAKER	CB1	1
12	560002	POWER TRANSFORMER	T1	1



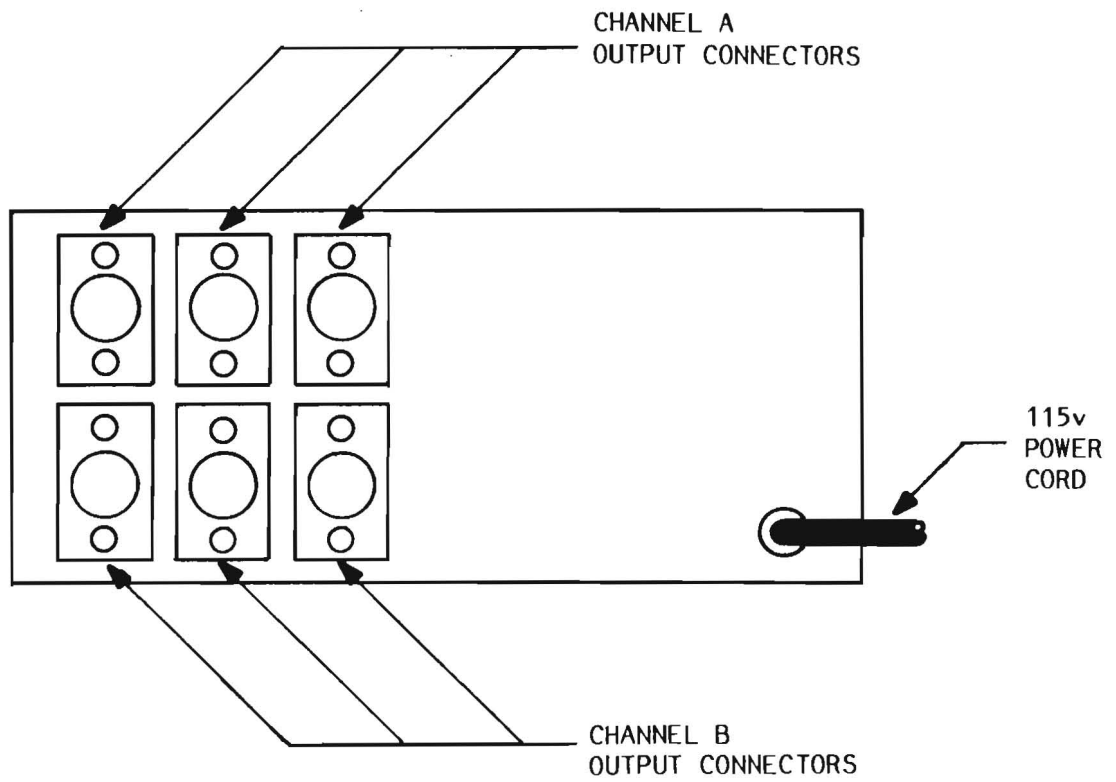
REVISIONS			
LYR	DESCRIPTION	DATE	APPROVED
A	UPDATED	5-17-77	
B	PWR. SUPPLY MODS 2497 EC	7-17-77	N/C
C	ECO 55 VOLUME POT CHANGE	1-4-80	
D	UPDATE PER ECO 56	1/23/80	
E	UPDATED, NEW P.C.B. (P.C.)	4/14/80	
F	ADDED C29 CS-76	4/15/80	F.C.
G	CHANGED BACK TO GAIN POTS ON REAR (P2, P4)	6/3/80	
H	REMOVED ECO 56 CHANGE	8/14/80	
I	ECO 58 R50 CORRECTION	2/29/80	
J	ECO 119 R50 CHANGE NAS47K	12/3/80	
K	ECO 231	10/6/81	

TOLERANCES UNLESS OTHERWISE SPECIFIED		FRACTIONS DEC ANGLES	
=	±	=	°
APPROVALS		DATE	
DRAWN MARK		12-11-78	
CHECKED		12-11-78	
SCALE		SIZE	
DRAWING NO		CS-200-771-K	
DO NOT SCALE DRAWING		SHEET 1 OF 1	

FRONT VIEW OF THE CS-200



REAR VIEW OF THE CS-200



SECTION VI

TROUBLESHOOTING THE CS-200

<u>SYMPTON</u>	<u>CAUSE</u>	<u>REMEDY</u>
1) System is totally dead, power switch light doesn't come on.	A) Loss of AC power B) Internal fuse has blown.	Plug main station into a known good outlet. Replace fuse.*
2) Circuit breaker trips repeatedly or short circuit LED remains lit.	Shorted or mis-wired interconnect cable. Defective remote unit.	Remove cables from main station one at a time until faulty line is isolated. Check for shorts between pins 1 and 2.
3) Call light doesn't work.	Bulb burned out.	Unscrew lens from lamp holder. Re- place lamp with GE 327.
4) Hum or Buzz in system.	Inductive pickup caused by close proximity of main or remote station to power lines or transformers. Ground loop caused by improper grounding of system (see installa- tion instructions). 10 ohm chassis ground resistor (R1) in main station open.**	Relocate offending unit. Reverse power cord. Lift ground. Measure resistance between chassis and pin 1 of connector. It should be 10 ohms. If not open main station, check resistor and replace.

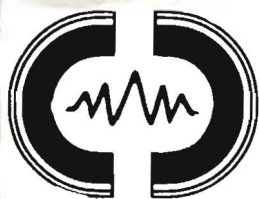
*If internal fuse blows repeatedly there is a very good chance that the bridge rectifier or something else has shorted inside the power supply. Have the station repaired.

**Note: This is caused by the system ground coming in contact with something that is "hot" with respect to main station earth ground. Should this occur, a careful check of the system ground and A.C. distribution in your location is recommended.

VI. SPECIFICATIONS

CS-200

AMPLIFIER DESIGN:	Solid-state IC plug in printed circuit amplifier module including signalling circuit. Current limited and short circuit protected.
MICROPHONE PRE-AMP:	
Microphone Input:	200 ohm dynamic nominal
Maximum Input Before Clipping:	-30 dB
Mic-Pre-Amp Frequency Response:	250Hz - 12kHz with a contoured response to enhance voice intelligibility
Headset Mic Input Level:	-55 db
HEADPHONE AMPLIFIER:	
Output Impedance Range:	150-600 ohms
Output level:	26 volts p- (+20 dBm) before clipping
Distortion:	<0.5% THD @ 1 KHZ
Amplifier:	35 dB
Frequency Response:	150 - 18 KHZ (+) 2 dB
AUXILIARY AMPLIFIER:	
Frequency response:	150 - 18,000 hz
Input:	47 kohms
Input level:	-15dB nominal; +2dB max
POWER SUPPLY:	
Output voltage:	28 volts circuit breaker protected, unregulated
Output current:	2 amps maximum
CHANNEL SEPARATION:	\geq 45 db
SIGNAL TO NOISE:	55 db
OPERATING CONDITIONS:	
Channel Monitoring:	A, B, or Both
Call Light Monitoring:	Follows channel select switch.
Capacity:	Will support up to 40 RS-100A or MR-102 remote stations or 15 KB-100 or KB-111 remote stations total on both channels.
System Impedance:	200 ohms nominal; 570 ohms maximum with two (2) stations; 90 ohms maximum with thirty (30) stations (6dB drop in level).
System Level:	-15 dB nominal; 0dB before clipping
SIGNALING:	
Call Light Sensitivity:	4 vdc
Signalling Voltage:	11 vdc
CONNECTORS:	
Headset Input Connector:	2 -4 pin connectors (D4M)
Output:	Channel A: 3 each in parallel, Switchcraft D3M Channel B: 3 each in parallel, Switchcraft D3M
Auxilliary Input:	Switchcraft D3M
POWER REQUIREMENTS:	115/230 volts 50-60 Hz. 80 watts maximum.
DIMENSIONS:	19"L x 3.5"H x 9.125"D
WEIGHT:	6 lbs. 15 oz.
ENVIRONMENTAL TEMPERATURE RANGE:	0 - 50 degrees C (32 - 122 degrees F)



Clear-Com

New Product

MR-102

Fixed Mounting Remote Station

Features:

- COMPATIBLE WITH EXISTING CLEAR-COM SYSTEMS.
- MOUNTS IN A STANDARD 4" SQUARE CONDUIT BOX.
- BRUSHED STAINLESS STEEL PANEL.
- COMBINATION MIC ON-OFF CALL SWITCH.
- HIGH IMMUNITY TO HUM AND NOISE.
- OPTIONAL CALL BUZZER.

SPECIFICATIONS:

ELECTRICAL DATA

FREQUENCY RESPONSE: 250 Hz-10K Hz.
INPUT IMPEDANCE: 200 Ohms at -55dB.
OUTPUT IMPEDANCE: 600 Ohms at 20 dBm.
AUDIO LINE LEVEL: -25dB.
SIGNAL TO NOISE RATIO: Better than 55dB.

FRONT PANEL

HEADPHONE VOLUME
MIC ON/OFF CALL SWITCH WITH INTERNAL CALL LIGHT.
FOUR PIN FEMALE XLR TYPE HEADSET CONNECTOR.

DIMENSIONS

OVERALL: 4.5" by 4.5" by 2.5".
DEPTH BEHIND PANEL: 1.8".

WEIGHT

9 oz.

HEADPHONES SPECIFIED

CC-240 M
CC-75 M
BEYER DT-109.

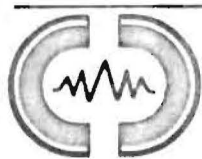


The **CLEAR-COM MR-102** is a remote intercom station, compatible with existing **CLEAR-COM Systems**, specifically designed for flush mounting in a standard 4" square conduit box. Three (3) screw terminals are provided at the rear of the unit for station inter-connection using the same 2-conductor shielded cable as the standard **CLEAR-COM**.

Additional features of the unit include a combination on/off-call switch with a self-contained call light for ease of operation and station privacy, an optional call buzzer for commanding the attention of busy operators in situations where the call light is inadequate and an XLR-type 4-pin female headset connector for superior strain relief and positive electrical connection. Improved noise and hum rejection has been made possible by electronic improvements and the elimination of the microphone transformer.

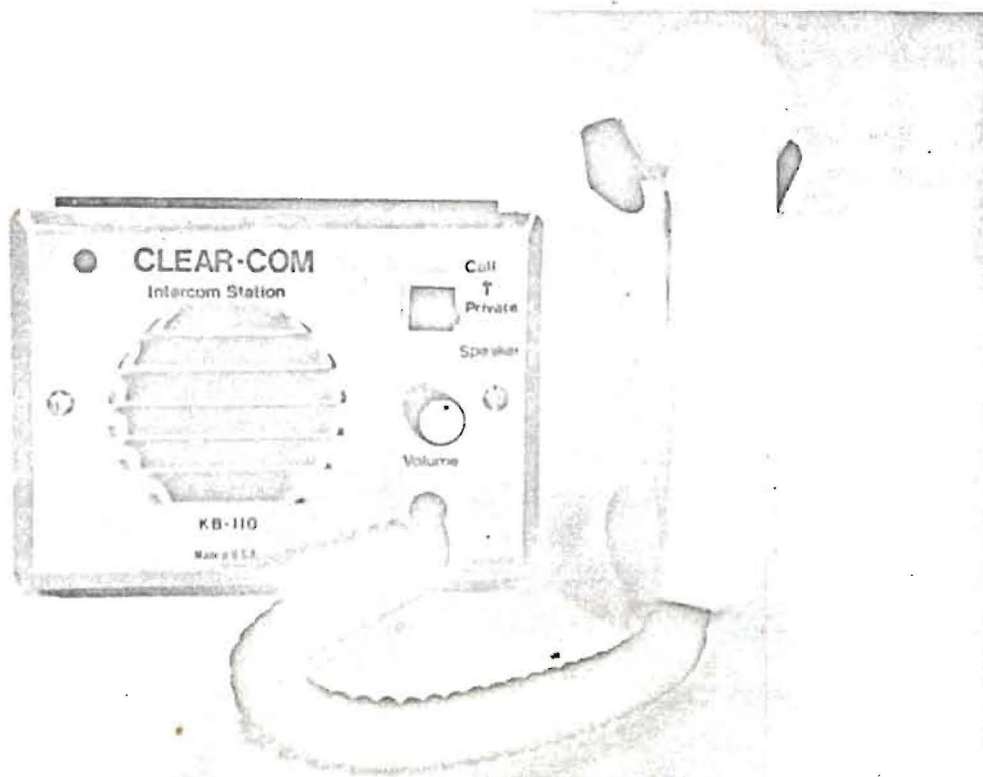
\$99 - List

759 Harrison Street • San Francisco, Ca. 94107 • (415) 989-1130



KB-110

Wall Mount Intercom Station



KB-110 King Biscuit Wall Mount Intercom Station

GENERAL

The KING BISCUIT KB-110 WALL MOUNT INTERCOM STATION is designed for permanent installation in conjunction with the CLEAR COM Intercom System.

DESCRIPTION

The KB-110 Intercom station consists of a telephone-type hand set with push-to-talk switch connected to the station with a 6 ft. coil cord. A screw-mounted cast aluminum hand set hanger is provided for mounting the hand set in a convenient location. Mounted in the stainless steel panel is a 4" weather proofspeaker, amplifier module, and signaling circuit. The front panel controls consist of a volume control and a combination speaker/mute switch. The volume control adjusts the listening level in the hand set and the speaker. The

speaker/mute switch will disconnect the speaker in the KB-110 to allow for private conversation with the hand set only. With the speaker switched on the KB-110 is convenient for paging applications. Side-tone in the hand set and speaker is adjusted by a trim pot on the amplifier module. Signaling from the KB-110 station to other stations is accomplished by momentarily depressing the speaker/mute switch in the upward direction. Visual signaling to the KB-110 station from other stations is indicated by illumination of the speaker/mute switch.

INTERCONNECTION

Screw terminals connect the KB-110 speaker intercom station wiring to other stations. The panel should be mounted in a 4½" H x 6¾" W x 2¼" D steel box.

KB-110 Wall Mount Intercom Station

APPLICATION

The KB-110 speaker intercom station is ideally suited for application where permanent installation is preferred and a headset is not necessary. A hand set gives you the convenience and privacy of a telephone, while the speaker allows for paging you to the station.

The volume level from the speaker is more than adequate to page under high noise conditions. The hand set level is well over 113dB maximum. High quality components will insure years of trouble free service. The amplifier module is of a plug in design and is field servicable. Installation instructions and a one year unconditional guarantee are included with each station.

Suggested applications are:

BOX OFFICE
DRESSING ROOM
LOBBY
LIGHTING BOOTH
GREEN ROOM
FLY RAIL
SECURITY
SET SHOP

SPECIFICATIONS

AMPLIFIER MODULE

Solid State integrated circuit module, short circuit proof w/"On Card" power supply regulation.

FREQUENCY RESPONSE: 200Hz to 10kHz \pm 1dB.
INPUT IMPEDANCE: 200 Ω .
POWER OUTPUT: 2 watts at 8 Ω .
MIC. INPUT LEVEL: -55dB.
DISTORTION: < .5%THD.
HUN & NOISE: < 50dB relative to output.

HAND SET

White telephone type of high impact plastic w/push-to-talk switch in handle. 6 ft. coil cord and screw mounted cast aluminum hand set hanger.

TRANSMITTER

ELEMENT: Dynamic w/water barrier.
OUTPUT LEVEL: -71dBV \pm 3dB (0dB = 1V per microbar) at 1Khz.
IMPEDANCE: 500 Ω .
RESPONSE: Rising response
100Hz - 6kHz.

RECEIVER

ELEMENT: Dynamic w/water barrier.
OUTPUT LEVEL: 113dB w/lmw input.
IMPEDANCE: 200 Ω .
RESPONSE: 100Hz - 6kHz \pm 3dB.

FRONT PANEL

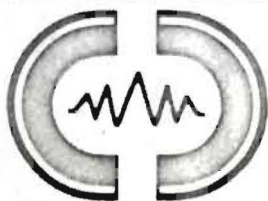
*Combination call/speaker mute switch and call light.
Volume control.
L.E.D. power-on indicator light.
FINISHED PANEL SIZE: 5 1/4"H x 7 1/4"D.*

MOUNTING CUT OUT DEMENSIONS

4 1/2"H x 6 3/4"W x 2 1/4"D.

WEIGHT

3 lbs. 9 Oz. (Including hand set).

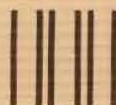


Clear-Com

INTERCOM SYSTEMS
759 Harrison Street, San Francisco, CA 94107
(415) 989-1130

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of trouble-free, high-quality performance.

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At Clear-Com we want to anticipate your future needs and continually improve our equipment. You can help us by completing and returning this questionnaire and warranty registration. We would greatly appreciate your assistance, and will gladly add your name to our mailing list so you will always be informed of our latest innovations, products, and updates. Thanks!

FILL OUT AND RETAIN THIS FORM FOR YOUR RECORDS:

Component Model #	Serial #	Component Model #	Serial #
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Purchased from: _____ Date _____

Address _____

ONE YEAR PRODUCT WARRANTY
(90 DAYS FOR HEADSETS)

- 1) **Clear-Com** warrants to the user who originally purchased the equipment that said equipment shall be free from defects in material and workmanship under normal and proper use, for the period of *one year* from date of original purchase (90 days for headsets) and agrees to repair or replace parts showing factory defects, subject to the following provisions:
- a. Defective products or parts must be delivered prepaid. Such products or parts, if proven defective, will be replaced or repaired by **Clear-Com** or a **Clear-Com** authorized service station.
 - b. The purchaser voids the warranty if he or others not authorized by **Clear-Com** attempt to service the unit, or if any parts not supplied by **Clear-Com** are inserted in the unit.
 - c. Inspection by **Clear-Com** will determine if defects in the equipment are due to normal use or if the equipment has been altered in any way, or repaired by other than **Clear-Com**-authorized service stations. **Clear-Com** will decide if the warranty is voided by negligent use, accident damage to the unit or parts, or damage due to the use of the unit for purposes other than for which it was designed.
 - d. Repaired or replaced parts supplied by **Clear-Com** under the warranty carry only the unexpired portion of the original warranty.
 - e. This **Clear-Com** warranty applies *only* to a new **Clear-Com** product which has been sold through authorized channels of **Clear-Com** product distribution.
- 2) This warranty includes the cost of all parts and labor for the designated period. The foregoing is in lieu of all other warranties, expressed or implied; **Clear-Com** neither assumes nor authorizes any person to assume for it any other obligation or liability, in connection with the sale of this product.

CLEAR-COM WARRANTY REGISTRATION CARD

Please complete this form, detach, and mail to Clear-Com as soon as possible. (Note: Accessories have no serial numbers).

----- cut here -----

Purchaser's Name _____ Company/Title _____

Address _____ Phone _____

Where Purchased _____ Date of Purchase _____

Component Model #	Serial #	Component Model #	Serial #
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Reasons why this system was chosen _____

Specific Application _____

How did you learn about Clear-Com? magazine ad ☐ which magazine (if known) _____ recommendation ☐ previous use ☐

other (please describe) _____ Would you like to be included on our mailing list? Yes _____ No _____

Can you suggest any improvements? _____